

**Central and Northern California Ocean Observing System**  
**Semi-Annual Report**  
**Period: June 1, 2007 to December 31, 2007**  
**Questions to Heather Kerkerling, [heather@mbari.org](mailto:heather@mbari.org), or 831-775-1987**

This semi-annual report for the NOAA CSC Award, NA05NOS4731123, is expected to cover the period of June 1, 2007 to November 30, 2007. The grant was awarded September 28, 2005.

**1) Project Summary**

CeNCOOS is nearing the end of a three-year (FY06-08) coordination and planning grant awarded by NOAA Coastal Services Center and administered by the Monterey Bay Aquarium Research Institute.

The awarded grant funds CeNCOOS to expand and continue regional coordination of ocean observing activities in central and northern California as part of IOOS, including the following:

1. Continue to expand CeNCOOS and coordinate outreach and education by:
  - a. Coordinated outreach strategy through End User Committee
    - i. Identify stakeholders that can aid in developing products
  - b. Coordinate and host user meetings for over 75 existing efforts
2. Develop data products based on data from existing ocean observing programs
  - a. Create a CeNCOOS product development team
  - b. Work towards a “State of the Region” real-time product on the website
3. Continue to work with Ocean.US, NFRA and neighboring RAs.
4. Identify, promote and coordinate pilot projects, working closely with COTS-funded projects such as CIMT and CICORE
5. Continue to develop the CeNCOOS geodatabase, OceanObs, with the Monterey Bay National Marine Sanctuary’s SIMoN program.
6. Coordinate communication between users and providers, researchers and committees
  - a. Monthly updates and sharing of meeting minutes
7. Implement a governance structure and business plan
  - a. Increase MOA signatories and establish a council
  - b. Draft Business Plan
8. Develop standard CeNCOOS public relations materials (brochure or poster).
9. Continue to provide maintenance and development on the CeNCOOS website
10. Manage data sets associated with existing ocean observing activities.
11. Continue to provide leadership to DMAC

With this grant, CeNCOOS focuses mainly on leveraging and coordinating existing efforts, integrating data and developing demonstration products, facilitating pilot projects, creating a data portal and web site, creating a metadata catalog, and developing as a regional association with strong governance and business structures.

This document includes information pertaining only to the past six months.

The majority of this award supports staff, data integration and product development efforts, and a local ocean observing program (FY06 only), the Center for Integrated Marine Technologies (CIMT). FY07 funding included: coordinator and  $\frac{3}{4}$  time oceanographer, travel costs, outside services (legal advice, public relations materials, web development, etc.), administrative assistance and supplies. FY08 funds cover coordinator time, part time database manager, the hiring of an Executive Director, product development and outreach materials.

This document includes information for the past six months. Documentation of progress from June 1, 2006 to May 31, 2007 was submitted in the two previous semi-annual reports and provides background information to adequately assess and follow progress within the past six months. Some overlap is provided here to give context to the report.

## **2) Progress and Accomplishments – RA Organizational Structure**

### *Summary Update*

- CeNCOOS continues to operate under a Memorandum of Agreement (MOA) and is guided by a 15-member Governing Council, signatories of the MOA, and CeNCOOS staff.
- CeNCOOS hired a part-time Executive Director, Dr. Steve Ramp. Dr. Ramp began on October 1, 2007.
- New MOA Signatories: SAIC
- CeNCOOS is considering the option of gaining non-profit status.
- CeNCOOS held three Council meetings in the sixth month time frame.
- CeNCOOS amended the election process for 2008.
- CeNCOOS is examining the possibility of creating new advisory committees and event response teams.
- CeNCOOS staff moved to new office space at MBARI. We now have our own CeNCOOS center!

Annual Council elections were held in January 2007 and a new 15-member Council was elected by the MOA Signatories. The Council members represent the entire CeNCOOS geographical region and a variety of disciplines, from non-profit leaders to scientists and government employees. The first meeting of the new Governing Council was held March 2, 2007. CeNCOOS focused efforts on preparing for an uncertain financial future by aligning our priorities with the state of California and those expressed by NOAA IOOS. The meeting included a review of each proposal submitted to the NOAA RFP released in January. CeNCOOS submitted 10 letters of intent; 4 were asked to be written to a full proposal. The Council agreed to begin a search for an Executive Director position. An interim Executive Committee was formed and subcommittee to begin drafting an Executive Summary for a CeNCOOS Strategic Plan. The Council approved continuation of the oceanObs database manager position through the UC Santa Cruz subaward,

development of fact sheets as outreach materials, and support for FNMOC to work with NRL for the continuation and expansion of the real-time wind COAMPS model. Decisions were also made to engage more industry partners and explore alternative operational structures, such as becoming a non-profit organization.

Our decision to align priorities with NOAA IOOS and the State of California is based on recent developments in both of these organizations. Zdenka Willis, Director of NOAA IOOS, and her IOOS team visited California and members of CeNCOOS. CeNCOOS was made aware of the NOAA IOOS 5-4-12 plan which included prioritization of oceanographic parameters collected and identified specific themes. In California, the Ocean Protection Council recently announced a 5-year strategic plan for improving ecosystem health throughout the entire state. CeNCOOS and SCCOOS are working closely with the OPC to implement many of their goals, avoid redundant projects and prove the value to IOOS to the state.

The second meeting of the Governing Council was held June 1, 2007 in Santa Cruz, CA at the National Marine Fisheries Service offices. Time was spent reviewing the recently awarded one-year “CeNCOOS Bays” proposal from the previous NOAA RFP process and the additional proposal comments received. This review led to a discussion of future RFP response methods and a strategy for creating the conceptual design. The Council agreed to focus third-year efforts on outreach materials, hiring of an Executive Director, and expanding partnerships.

Between the second and third Council meetings, the CeNCOOS Executive Committee completed the hiring process for a CeNCOOS Executive Director. Dr. Steve Ramp was chosen among many qualified applicants to begin October 1, 2007 as the part-time CeNCOOS Executive Director at the Monterey Bay Aquarium Research Institute.

The third meeting of the Governing Council was held September 7, 2007 in Tiburon, CA. This meeting proved extremely useful in shaping CeNCOOS priorities. At the open public meeting, the CeNCOOS Governing Council discussed input from 19 responders, and decided that monitoring the environment in protected marine areas such as the MPAs and the National Marine Sanctuaries would serve as the unifying goal of the 2008-10 implementation proposal. This meeting was well-attended with an enormous amount of interest and input represented. In addition to shaping our priorities with NOAA IOOS (now Data Integration Framework (DIF) rather than 5-4-12) and the Ocean Protection Council, CeNCOOS discussed alignment of efforts with the West Coast Governors Agreement on Ocean Health, the Marine Life Protection Act and the Marine Life Management Act, and the newly formed MPA Monitoring Enterprise under the California Ocean Science Trust.

The fourth and final meeting of the Governing Council was held at the Bay Conservation Development Commission in San Francisco, CA on December 7, 2007. Discussions included identification and engagement of priority stakeholders, conceptual design template for NOAA IOOS, and refinement of the upcoming annual elections. The Council decided to amend the election process outline in the MOA. In 2008, three

Council members will be replaced with representatives from the northernmost and southernmost regions of CeNCOOS and from industry. The remaining 12 will continue to serve as CeNCOOS Council members. Elections will be completed in mid to late January 2008. The CeNCOOS staff will soon be reviewing the following: Council obligations and meeting requirements; Executive Committee composition; Council composition; and the possible creation of additional advisory groups and/or committees.

## **Progress and Accomplishments – Planning and Implementation**

Business plan – system priorities – observing system design for the region – regional data management

### *Business Plan*

CeNCOOS shares a Resources Legacy Foundation grant with SCCOOS to develop a business plan representing the collaboration between regional associations in the state of California. Heather Kerkerling and Stephanie Peck have met a number of times to discuss the progression of the business plans, draft outlines and text, and share information pertinent to both Regional Associations. CeNCOOS staff and Council have also created an end user survey for ocean observing needs, drafted and come close to passing organizational bylaws, discussed and supported a short-term vision for CeNCOOS, increased stakeholder engagement and participation, increased the number of MOA Signatories, greatly enhanced the oceanObs geodatabase and identified additional partners for contribution to OceanObs, developed a Live Access Server from regional partner data, identified and began work on a number of pilot projects associated with the Working Groups, and created a real-time and forecasting demonstration project using surface current information, satellite imagery and winds. CeNCOOS is also working to become the data portal for the region by identifying and contacting potential technology and equipment hosts.

In the past year, CeNCOOS staff have worked directly with SCCOOS staff to expand the business plan. Efforts are being made to synthesize extensive end user survey results and translate them into identifiable products and applications. This survey has proven critical to guiding CeNCOOS priorities and also serves as a model for other regional associations in regards to successfully identifying end user needs. CeNCOOS and SCCOOS recently hired a contractor to provide guidance to the business plan development. CeNCOOS is refining the executive summary, analyzing user workshops, and working with local observing programs to gain an estimate of data and technology needs and overall operational costs.

The NOAA RFPs released in January and in June allowed for the creation of a larger Regional Coastal Ocean Observing System proposal. In January, over 20 organizations collaborated to create a proposal focused on the water quality and ecosystem health of ‘CeNCOOS Bays:’ San Francisco, Monterey, Morro, Humboldt, and Bodega. In creating this proposal, CeNCOOS was able to identify what already exists and pull stakeholders

and partners together to create a conceptual design for our Bays. In addition to the RCOOS proposal, CeNCOOS worked with numerous organizations to design proposals related to: animals as ocean sensors, larval dispersal for MPA management, creating a data network node, and continuing development of the ocean observing inventory. Unfortunately, the “CeNCOOS Bays” proposal submitted in January received only minimal funding for one year. Fortunately, CeNCOOS learned from our response process and from the reviews received. Results of the learning process proved useful in responding to the second RFP announced in Summer 2007. CeNCOOS submitted one proposal titled, “Long-term monitoring of environmental conditions in support of marine protected area management in central and northern California.” The final proposal represented a strong collaborative effort that included the makings of a successful business plan design, from supporting existing observations, implementing new instrumentation and observing locations, identifying a process and an entity to move forward with data management, applying modeling efforts, education and outreach, and assigning a cost to the system. The Director and Coordinator plan to move forward with these efforts to develop a business plan.

#### *Priorities and System Design*

CeNCOOS has accomplished much over the past twelve months with regards to defining regional observing system priorities, making progress toward development of observing systems, and toward regional data management. Many of our efforts were showcased in collaborative projects and conferences, allowing for increased and improved partner sharing. These opportunities also influenced the short and long term direction of CeNCOOS, from governance to data management and outreach.

CeNCOOS has organized activities around three priority areas, in which new observations can yield new products and identifiable socio-economic benefits in our region. Initial discussion and activities were directed at identifying pilot projects, developing collaborations, and sketching out demands and budgets for observations, analysis, modeling, data management and product development. These working groups map well onto IOOS priorities and ongoing activities under COCMP, CIMT and CICORE. Results to-date have been mixed and formal establishment of working groups has not yet been completed. New participants are welcome to join these working groups.

➤ ***Marine Populations.*** With a focus on living marine resources, including fisheries and conservation, this working group is targeting the identification of critical species as indicators of the state of Central California Current Ecosystem. A draft document was prepared in 2006 on the State of the Central California Current Ecosystem with the Monterey Bay Aquarium Research Institute.

CeNCOOS is participating and leading numerous efforts related to this working group. For example, the State of the Central California Current Ecosystem report has helped guide CeNCOOS participation in the following efforts:

- Developing a “State of the Bay” report card for Monterey Bay with the Monterey Bay Crescent Ocean Research Consortium and FNMOC. This effort continues today. The group has met 5 times and engaged numerous local experts to offer advice and guidance.

- Serving on the planning Committee for the California Current Ecosystem-Based Management Conference along with UC Santa Cruz and COMPASS. The CCEBM conference is scheduled for January 29-31, 2008.
- Serving on the planning committee for the Coastal States Organization/CeNCOOS/SCCOOS manager workshop in September titled, “Making Use of Ocean Observing Systems: Applications to Marine Protected Areas and Water Quality”
- Creating an “Environmental Prediction” animation for the website regarding the linkages between large-scale oceanographic processes and nearshore, biological conditions.

➤ **Water Quality.** Targeting both public health and ecosystem health issues, this working group is approaching water quality issues both via inflow to the coastal ocean from specific sources (e.g., San Francisco Bay) and via focus on specific issues (e.g., harmful algal blooms). Work to-date has included research proposals and also the initial plans for integrating water quality and coastal circulation data in the study and monitoring of harmful algal blooms. CeNCOOS is working closely with CIMT, CICORE, the Monterey Bay National Marine Sanctuary, the San Francisco Estuary Institute, Environmental Health Departments and Regional Water Quality Control Boards to develop an application for addressing and understanding water quality and coastal management.

CeNCOOS is participating in a number of efforts related to this particular working group.

- 2007 Monterey Bay endless red tide. CeNCOOS is organizing an effort to better understand the summer and fall red tides and its relationship to injured/dead sealife. Institutions involved include CA Department of Fish and Game, Oil Spill Prevention and Response; COCMP; BeachCombers; CIMT; UC Santa Cruz; Santa Cruz Department of Environmental Health; and the Monterey Bay Aquarium Research Institute.
- Responded to a request from the SF Public Utilities Commission to provide surface current trajectories of a ‘cap’ that dislodged from a sewage outflow pipe off Ocean Beach in San Francisco. The information provided allowed the SFPUC to make a successful and rapid response to a potential emergency situation.
- Created a number of press releases regarding recent HAB and ocean observing technologies that aid in understanding the events, sources, impacts, and linkages to human and wildlife health.
- RCOOS proposal to NOAA for improving water quality monitoring and tracking in all CeNCOOS Bays, specifically San Francisco Bay. This proposal included input and participation from approximately 20 partners.
- Collaborated with numerous water quality experts throughout the state in the planning for the CSO workshop hosted in September.
- Participated and contributed to the Monterey Bay National Marine Sanctuary’s Synthesis, Assessment and Management (SAM) program and workshop focused on integrating water quality programs in the Monterey Bay area.

- Contributing to the development of the National Water Quality Monitoring Network (NWQMN) San Francisco Pilot Project.

➤ ***Marine Operations.***

The Marine Operations group serves the maritime, search and rescue, and event response communities. The main technologies utilized are the HF radar antennas strategically situated along the coast of California to provide real-time surface current information.

Marine Operation events include:

- November 2007 *Cosco Busan* Oil Spill. Based on efforts and relationships from the Safe Seas 06 event, CeNCOOS was able to provide surface current information, oil spill trajectories, and additional environmental data and contacts to the command post in San Francisco. Programs working with CeNCOOS included NOAA ORR, NOAA HAZMAT; NOAA NMSP; and OSPR.
- CeNCOOS is working with PG&E as they explore the option of ocean wave energy off the coast of northern California.
- This summer (2007), CeNCOOS worked with the Coastal Data Information Program (CDIP), USGS, San Francisco Bar Pilots, the US Coast Guard, the National Weather Service, Scripps Institute of Oceanography, the US Army Corps of Engineers, and San Francisco State University to deploy a CDIP buoy in the SF Bar Channel at the request of SF Bar Pilots. CeNCOOS is looking for funding for an replacement buoy and is engaging maritime personnel in the development of a one-stop online page for SF Bay navigation.

Funding from the State of California has been more directed, supporting two consortiums of institutions with \$21M to establish a statewide high-frequency (HF) radar array to monitor coastal surface currents, known as the Coastal Oceans Currents Monitoring Program (COCMP). The consortium in northern and central California works closely with CeNCOOS and sees itself as part of the CeNCOOS regional association. For example, the HF Radar technologies, in addition to existing CeNCOOS assets within the Marine Operations Working Group, were successfully integrated into surface current trajectory models for NOAA's Safe Seas 06 oil spill drill in San Francisco, California and the real November 2007 Cosco Busan oil spill in San Francisco Bay. In each event, CeNCOOS provided NOAA and state programs with historical and real-time biological and physical data, GIS layers for ecological monitoring and decision-making, GPS-equipped surface drifters, and HF radar technologies. CeNCOOS worked closely with many organizations including NOAA, US Coast Guard, CA Office of Spill Prevention and Response, CA Department of Fish and Game, and local research institutions, rescue teams, and the media. Our single greatest contribution was the ability to accurately provide real-time and near real-time surface current models. Working under severe time constraints, the COCMP program was able to complete the installation of six HF radar sites used in the drill as well as create an avenue for accurate, near real-time data streams. The technology, efforts, and applications were very well-received by the scientific community! [http://www.cencoos.org/currents/ocean\\_currents.htm](http://www.cencoos.org/currents/ocean_currents.htm)

CeNCOOS and SCCOOS collaborated in a more recent effort to provide similar products for displaying HF Radar statewide. <http://www.cencoos.org/hfrnet/>  
A site acknowledging our efforts in the 2007 oil spill and relationship with NOAA can be found here: [http://www.cencoos.org/SF\\_Oil\\_Spill2007.htm](http://www.cencoos.org/SF_Oil_Spill2007.htm) Included on this site is a link to an article in the local newspaper regarding our contributions to the SF 2007 spill.

CeNCOOS is working with NOAA IOOS, USCG, NOAA ORR, NOAA HAZMAT, NOAA NMSP; and the State Ocean Protection Council and Coastal Conservancy to review our response efforts to the 2007 spill.

Significant efforts have also been made to move the Water Quality Working Group forward. Specifically, we led a successful workshop focused on ocean observing systems and water quality; are strong participants in the MBNMS SAM water quality project; and are participating in the NOAA-EPA-USGS National Water Quality Monitoring Network effort through the San Francisco Pilot Project.

CeNCOOS provided surface current trajectories to aid the SF Public Utilities Commission in a response to a 'cap' that dislodged from a sewage outflow pipe off Ocean Beach. SFPUC was very grateful and used the information to make successful management decisions.

CeNCOOS is leading an effort to provide oceanographic data to examine red tide events in Monterey Bay. Since September 2007, some form of red tide has existed in the Bay. Simultaneously, hundreds of seabirds have become injured or died. We're leading an effort to examine the potential relationship between these events. A meeting is scheduled for December 17, 2007. <http://www.cencoos.org/MontBayRedTideNov07.htm>

CeNCOOS also aids in designing the observing systems by participating in monthly NFRA conference calls and attending various meetings and conferences related to IOOS, the Regional Associations, the Ocean Protection Council, and ocean observing in general. Heather Kerkerling, Steve Ramp, Francisco Chavez (MBARI), Dave Foley (NOAA ERD), Paul Siri (CA OPC), and Rondi Robison (CIMT) and others from the region have participated in a number of planning meetings for IOOS and the National Federation of Regional Associations (NFRA). Heather Kerkerling and Council members Francisco Chavez and Churchill Grimes also serve to improve development and prioritization by participation on the PaCOOS Board of Governors, meeting regularly for conference calls and in-person meetings.

The CeNCOOS observing system is developed in collaboration with Pacific Ocean partners, including PacIOOS, AOOS, NANOOS, SCCOOS and PaCOOS. CeNCOOS attended and participated in a recent PaCOOS workshop that led to a few action items geared toward better understanding RA relationships to PaCOOS and toward developing a large Pacific-wide model that links large oceanographic patterns to nearshore and local events. CeNCOOS is also on the planning committee for the California Current Ecosystem Based Management Conference scheduled for January 2008. This planning committee consists of UCSC and COMPASS. The conference involves development and



collaboration with Science and Steering Committees for the workshop from around the entire west coast. San Francisco Bay was also recently selected as one of the Pilot Projects for the National Water Quality Monitoring Network (NWQMN). CeNCOOS is participating in this effort and serving as a representative to IOOS as we link these two programs together. CeNCOOS also worked with the Humboldt Bay Harbor Recreation and Conservation District to host a meeting in Humboldt with representatives from HSU, SeaGrant, NOAA NWS, USCG, SF Marine Exchange, and many others. Recent Council meetings have encouraged forward movement in the development of a conceptual design, Executive Summary and business plan.

In March 2007, the Monterey Bay National Marine Sanctuary Symposium provided CeNCOOS an opportunity to showcase our program to a large audience, from the public to teachers, scientists and government groups. CeNCOOS emceed the Symposium titled, "Observing Systems for Ocean Health." CeNCOOS Council members served as presenters and speakers, CeNCOOS worked with CICORE, CIMT and CSUMB to create an exciting, interactive exhibit, and we worked with many local partners on the poster session.

CeNCOOS priorities and goals are most influenced by the response process to NOAA RFP announcements. Upon receipt of the NOAA approval to submit a full proposal for the summer/fall RFP process, CeNCOOS engaged the stakeholder community by inviting participation in one of four groups created to move the proposal process forward: sensing array design; model development; data management and communications; and product development. Over 15 organizations chose to participate in the process, submitting ideas and budgets to support CeNCOOS proposal goals. The group chairs and CeNCOOS staff then convened to create a final proposal and budget.

As the California Current knows no geopolitical bounds, CeNCOOS will collaborate with our neighboring regional associations to the north (NANOOS) and south (SCCOOS) on issues affecting the entire west coast, especially via the pan-regional backbone (PRB) described in detail below. CeNCOOS and SCCOOS have signed an MOU (see Appendix) to ensure that the State of California has a common data access method for certain coast-wide sensors such as the HF radars and the Coastal Data Information Program (CDIP) wave buoy network. The proposed observing system is ideally suited to address all seven societal issues as set forth in the national IOOS plan. CeNCOOS and SCCOOS support the objectives of the West Coast Governor's Agreement on Ocean Health, particularly protecting and restoring healthy ocean and coastal habitats, promoting ecosystem-based management of ocean and coastal resources, expanding ocean and coastal scientific information, research, and monitoring, and increasing ocean awareness and literacy among our citizens. The proposal also meets the priorities outlined by the Partnership for Interdisciplinary Studies of the Coastal Ocean (PISCO); CA Department of Fish and Game; the Marine Life Protection Act and the Marine Life Management Act; the State MPA Monitoring Enterprise, the Ocean Protection Council and the National Marine Sanctuary Program.

CeNCOOS priorities are also shaped by participation and contribution in numerous workshops and conferences:

Heather and/or Steve have represented and discussed the value and efforts of IOOS at numerous events, including

- All NFRA Meetings and Conference Calls
- Regional Ocean Governance workshop in Monterey, CA
- All Ocean Protection Council meetings
- Sanctuary Symposiums
- Humboldt Workshop in Spring 2007
- Coastal Zone 07
- Ocean Energy Conference 07
- CSO Workshop
- NOAA/POST meeting in Santa Cruz
- PaCOOS BOG Meeting
- Remote Sensing Workshop at MBARI
- AUV Workshop at MBARI for the CA OPC
- IOOS and Industry Workshop – San Diego, 2007
- Estuarine Research Federation
- PISCO Conference on Climate Change
- National Water Quality Monitoring Network
- Local WQ meetings and Sanctuary Events such as the Monterey Bay National Marine Sanctuary Regional Water Quality Monitoring Coordination Workshop: The Central Coast Water Quality Data Synthesis, Assessment and Management Project. Also, continuous meetings of the Northern CA Beach Water Quality Monitoring Workgroup

Participation in these events allows for improved collaboration and strategizing of priorities.

#### *Data Management*

CeNCOOS is working with local partners to continue expanding both the ocean observing inventory and the Live Access Server/ Data integration demonstration project. At the IOOS Regional Catalog Workshop Planning, the CeNCOOS information management and data discovery tool, OceanObs ([www.oceanobs.org](http://www.oceanobs.org)), was highlighted as one of the two major systems in the nation that could develop an inventory of observing assets that provide data in near real-time as well as a queryable map of existing assets. It was suggested that OceanObs serve as one possible aggregator of West Coast observing information that would then feed into a national repository. The OceanObs team is currently working to populate the database, expand to other IOOS programs, and meet the established technical requirements. OceanObs was built in collaboration with the Monterey Bay National Marine Sanctuary, the program now spearheading the National IOOS Registry.

CeNCOOS released the first data integration project at the California and World Ocean conference in September 2006. CeNCOOS continues to expand these efforts. The core of the system is a LAS that incorporates near real time and historical data streams from over 10 organizations. The first demonstration integrates satellite imagery with surface currents. This will include a display of near real-time currents and the ability to perform data manipulation including animation sequences, extraction of time series, and the interactive capacity to travel the path of a virtual drifter. The project was designed and built in compliance with IOOS DMAC recommendations for data transport and browsing. CeNCOOS hopes to expand the demonstration project to meet more end user requests and the needs identified by each Working Group. The second outcome from this effort will most likely focus on displaying water quality conditions for the benefit of public health (described above).

OceanObs was created in May 2005 and has greatly improved over the past year due to effort contributed by the product development team and the database coordinator. OceanObs is the first web based metadata inventory for ocean research and observing activities in central and northern California. It is also a data discovery tool for a variety of users. To date, the oceanObs database consists of over 50 partners, 100 variables, 85 unique devices; 2615 study sites; and 390 data products. OceanObs is our greatest project to date! It is interactive and serves as a valuable tool to many end users. CeNCOOS is able to direct people to this site for their inquiries. CeNCOOS continues to engage organizations and institutions to contribute their data to the system. The request to build such a database is one heard often and at numerous conferences and meetings. CeNCOOS travels to workshops and conferences to demonstrate the value of the effort.

The Live Access Server and Demonstration project also highlight our progress toward regional data management. The LAS provides access to real-time data from a variety of Partners. Created with funds from the NOAA grant and in collaboration with the Environmental Research Division and Coastwatch, we've successfully created a data integration project demonstrating machine – to – machine interoperability that fulfills IOOS data management and connectivity protocols and allows data to be downloaded. You can search by variable, time scale, region and organization to receive actual data, graphs, and images from the contributing partners. We are looking forward to expanding this effort to include more CeNCOOS data collectors.

The Demo project includes HF Radar surface current modeling in 1, 25 and 33hr radial measurements from Monterey north to SF Bay, satellite imagery demonstrating *Chl a* concentrations and/or SST, and moorings. Users can also place a drifter at a specific location and receive a forecast animation of its movement. This product is still under development and in need of user feedback (*in progress*).

SCCOOS also hosts a google-based COCMP model for the CeNCOOS website. This demonstrates a clear united California Regional Association front using the state's contribution of HF Radar and surface current measurements.

CeNCOOS continues to build and develop data products in accordance with IOOS DMAC and MMI guidelines. CeNCOOS proposed a “regional network node” in the most recent proposal to the NOAA RFP. In the proposal, CeNCOOS identified SAIC as the data management lead. The proposal efforts include an expansion of the registry, OceanObs, the development of a portal and data assembly center, and archiving capabilities. Numerous organizations have committed to participating and supporting the data management effort.

### *Stakeholder Engagement*

#### Workshops Held in the past six months

- Making Use of Ocean Observing Systems: Applications to Marine Protected Areas and Water Quality
  - The Coastal States Organization; California Coastal Conservancy; California’s Ocean Science Trust; CeNCOOS and SCCOOS sponsored the workshop on September 25-26, 2007. The purpose of the workshop was to convene a group of managers and ocean observing experts to determine the requirements for a coastal ocean observing system that would meet the needs of both water quality and MPA managers in California. Over 60 workshop attendees, from managers to scientist to policy-makers, participated in working groups focused on the value of ocean observing to addressing water quality issues and monitoring MPAs. The objective was for each group to develop a system design based on managers’ needs that could be overlaid to identify how a single system could meet multiple needs.
  - This effort proved very useful in the recent proposal development and in terms of identifying priorities and future product development.
- Autonomous Platforms and Sensor Workshop
  - In coordination with MBARI and the Ocean Protection Council, this workshop was hosted for the OPC staff as they are making their decisions on best technologies and strategies for monitoring our oceans. It was well-attended meeting with speakers from Scripps, CalPOLY, MBARI, University of Miami, Stanford, Oregon State University, UC Santa Cruz, and the RAs. It was a great opportunity to showcase advancing technologies and discuss costs and benefits of capabilities and platforms.
- Modeling Workshop for Monterey Bay scientist
  - CeNCOOS hosted an event with the Monterey Bay Crescent Ocean Research Consortium to bring together modelers in the area and to showcase new tools and technologies.
- Quarterly Council meetings open to the public
  - See “Organizational Structure” section above for a description of Council meetings
- NOAA IOOS, CeNCOOS and MBARI
  - CeNCOOS and MBARI hosted Zdenka Willis September 11-12, 2007. Zdenka was able to meet with many MBARI staff, the Marine Metadata Interoperability team, and CeNCOOS partners from UC Santa Cruz, Moss

Landing Marine Labs, Alliance for Coastal Technologies, Center for Integrative Coastal Observation Research and Education, Center for Integrated Marine Technologies, Coastal Ocean Currents Monitoring Program, Fleet Numerical, and the Naval Postgraduate School.

Workshops to be held:

- Oil Spill Review
- Scheduled for January to discuss roles and communication between COCMP, CeNCOOS, NOAA programs (including IOOS); OSPR and the USCG.
- Monterey Bay “Red Tide” Mystery
- Late December: Local oceanographers, water quality specialists and wildlife experts are convening to link together ocean information related to the recent red tides and simultaneous bird injuries and deaths. Programs involved: MBARI; CA DFG and OSPR; UC Santa Cruz; CIMT; COCMP; and Environmental Health Departments.

CeNCOOS is on the Steering Committee for the following:

- California Current Ecosystem Based Management Conference: January 2008
- Climate Summit Initiative with the Gulf of Farallones National Marine Sanctuary
- Humboldt Bay Symposium: April 2008

The focus and content of the recently submitted proposal represents the input and perspectives shared from an inclusive and effective engagement of CeNCOOS stakeholders. Receptive to the review comments from previous proposals, the Governing Council agreed to create and support one RCOOS proposal for the region. With this agreement, it was extremely important in the process to truly engage, collect, understand and represent the ideas of CeNCOOS stakeholders. Stakeholders were initially engaged through the CeNCOOS –wide email that 1) announced the RFP opportunity; 2) articulated the need to address the goals of CeNCOOS, NOAA IOOS, the State of California and the West Coast Governors Agreement; 3) provided a list of eleven high-priority societal issues; and 4) requested a one-page letter identifying the most pressing issue and what CeNCOOS assets and capabilities existed to address this issue. Following the procedure outlined in the email request, the Governing Council received and discussed the 19 response letters. Organizations submitting letters represented non-profit groups, academic institutions, private corporations, educational programs, and state and federal government agencies. Representatives and members of the public were invited to participate in the September 7, 2007 Council meeting to discuss the proposal process and focus. Taking the response letters and comments into account, the Council agreed to focus the proposal on environmental observations related to Marine Protected Areas (MPA).

Upon reception of the NOAA approval to submit a full proposal, CeNCOOS reengaged the stakeholder community by inviting participation in one of four groups created to move the proposal process forward: sensing array design; model development; data management and communications; and product development. Over 15 organizations

chose to participate in the process, submitting ideas and budgets to support CeNCOOS proposal goals. The group chairs and CeNCOOS staff then convened to create a final proposal and budget.

During the proposal writing process, CeNCOOS was fortunate to host a workshop, “Making Use of Ocean Observing Systems: Applications to Marine Protected Areas and Water Quality,” in collaboration with the Coastal States Organization, California Ocean Protection Council, National Federation of Regional Associations, and SCCOOS. Over 60 managers, scientists, and politicians representing interests and roles in MPA and water quality initiatives met to discuss the value of regional ocean observing systems. Needs for improved monitoring and evaluation of MPAs as well as advice on implementing the State MPA Monitoring Enterprise were expressed and are adequately represented in this proposal. Discussions following this workshop were also vital to capturing stakeholder needs and proposal guidance. In addition, CeNCOOS staff held meetings with individuals and organizations active in MPA monitoring and evaluation, including the National Marine Sanctuary Programs, Ocean Protection Council, California Department of Fish and Game, MPA Monitoring Enterprise, the Partnership for Interdisciplinary Studies of Coastal Ocean.

The stakeholder engagement process was broad, inclusive, efficient and fair. CeNCOOS adequately collected, responded to and represented the priorities and issues most commonly identified by our coastal and ocean community in both recent and past engagement processes. The environmental parameters we propose to monitor will also provide information to other commonly identified priorities: harmful algal blooms, ecosystem-based management, and integrated ecosystem assessments.

#### *New Partnerships*

The following is a list of new partnerships in 2007. For additional partners, please see previous progress reports:

Water Quality Control Boards through the entire CeNCOOS region  
California Academy of Sciences  
SAIC  
Marine Advanced Technology Education  
Surflife  
Surfrider Foundation  
Monterey and Santa Cruz County Environmental Health Boards  
Sonoma County Water Agency  
California Ocean Sciences Application  
Pacific Ocean Shelf Tracking Project – Acoustic Tagging  
PG&E  
CDIP

#### *News Parties to CeNCOOS include:*

SAIC joined recently to bring CeNCOOS MOA Signatories to a total of 40!

*Contributors to OceanObs in the past six months include (bringing the total to 52!):*

Alameda County Environmental Health Services Center for Coastal Marine Sciences (CCMS)  
Central Coast Watershed Studies (CCoWS)  
Cordell Bank Ocean Monitoring Project  
Department of Water Resources (DWR)  
Gulf of the Farallones National Marine Sanctuary  
Humboldt County Environmental Health Department  
Marin County Environmental Health Services  
Monterey Bay Aquarium (MBA)  
Monterey County Environmental Health Services (MC-EHS)  
Point Reyes Bird Observatory (PRBO)  
San Luis Obispo County Environmental Health Department  
San Mateo County Environmental Health Department  
Santa Barbara County Environmental Health Services  
San Luis Obispo Science and Ecosystem Alliance (SLOSEA)  
Sonoma County Environmental Health Department  
BEACH COMBERS (coming soon)

Steve Ramp, Heather Kerkerling and Tom Wadsworth have traveled extensively throughout the state to visit with organizations and programs on a one-on-one basis to engage stakeholders and advertise CeNCOOS.

CeNCOOS is also an advocate of the “Thank You Oceans” campaign. This effort allowed for a connection with staff and exhibit teams from Aquariums throughout California as well as each National Marine Sanctuary Visitor Center.

#### *Website Development*

The website is now one year old! The website was a huge effort which included much time and input from Dale Robinson, Paul Siri, Rondi Robison, Heather Kerkerling and Natasha. The ultimate goal is that the website will serve as the data portal to the region while being as user-friendly as possible. The site provides basic information about CeNCOOS, IOOS and ocean observing, as well as access to program web pages, real data, current coastal conditions, legislative and developmental documents, oceanObs, the Live Access Server, the Demonstration project, and an event calendar. We continuously update the site and receive input from organizations and end users on how to improve access to information and user friendliness. We are often approached by local organizations and attempt to meet request to host models and applications on our website. We developed a demonstration project that provides access to a SCCOOS-developed google map demonstrating state surface current mapping. CeNCOOS also plans to add more education links and make the website more user-friendly for all end-user perspectives.

The site is maintained by both MBARI administration and Tom Wadsworth. We monitor it to keep it up to date, providing access to current conditions and making it a user friendly as possible for accessing information and data. CeNCOOS is also developing pages in response to events, such as the oil spill,

[http://www.cencoos.org/SF\\_Oil\\_Spill2007.htm](http://www.cencoos.org/SF_Oil_Spill2007.htm), and the red tide,  
<http://www.cencoos.org/MontBayRedTideNov07.htm>

#### *Education Products and Connections*

CeNCOOS needs to work further on developing the educational component of ocean observing. The following efforts have enhanced our educational goals:

- Flyers and brochures distributed at conferences and local events
- Conference exhibits
- Meetings with NERR, MBARI and EARTH, MATE, and COSEE
- Brochure

CeNCOOS plans to develop an Education Committee for planning the 2008 teacher workshops with MBARI EARTH to highlight Ocean Observing Systems.

CeNCOOS has contracted CIMT to develop fact sheets on the following topics for distribution:

- Surface Current Monitoring
- Animals as Ocean Sensors
- Harmful Algal Blooms

Additionally, CeNCOOS and CIMT have designed a success story template to highlight events in the region. We currently have success stories to distribute for:

- Oil Spill Response
- Red Tide Response: Abalone Company Saves Money With Oceanographic Information
- OceanObs Inventory
- SF PUC: Monitoring oceans for environmental and public health

CeNCOOS will begin printing these fact sheets and success stories in early January. CeNCOOS is also contributing efforts to CIMT and the Seymour Marine Discovery Center to develop a phytoplankton search engine for the public and scientists.

A CeNCOOS Council member, Sarah Allen, plans to work with Heather Kerkering to create easily-distributed posters and animated videos to regional education and outreach centers.

### **3) Scope of Work**

*Outline the priorities for the next funding period (through May 2008) and describe any current or anticipated changes to the statement of work or in meeting objectives (due to problems encountered, involved approach, etc). **red = completed***



Much of the funding was reallocated to salary for the new Executive Director, Dr. Steve Ramp. This may impact future travel schedules, the ability to host meetings, and the ability to print and distribute outreach materials.

Priorities for the next funding period include (in no particular order):

- Establishment of a new Council (3 new members for a total of 15)
- Expansion of the Live Access Server, the Demonstration Project, and the Water Quality pilot project with NOAA ERD and SAIC.
- Aiding with state projects: desalination, levees, habitat mapping, and ocean energy
- Improving and supporting the MBNMS SIMoN partnership to develop oceanObs
- Identify methods for leveraging from various observing programs in the region for the data integration, product development, and outreach.
- The California Current Ecosystem Based Management Conference (pre and post work)
- Establishing official bylaws and a short and long term vision.
- Continuing partner engagement and demonstration of the value of ocean observing.
- Developing public relation materials for workshops, conferences and events. CeNCOOS will continue to work with CIMT to develop outreach materials.
- Finalize the Executive Summary, conceptual design and business plan.
- Complete more success stories and share them online
- Work with various organizations and find funding for requested SF Bar Pilot buoy for the deep water channel
- Work with NOAA NERR Coastal Training Program to share CeNCOOS resources with additional end users
- Participate in upcoming meetings: Climate Summit Initiative; IOOS and CoML; Ocean Sciences
- Redesign governance structure to be more effective and inclusive
- Research alternative funding opportunities
- Collaborate with Sonoma County Water Agency and PG&E to become more involved with ocean energy in the north coast
- Summarize information from workshops hosted and attended to develop a guidelines for ocean observing systems
- Follow through with results from the CSO workshop and collaborate with the contractor hired to help an ocean observing plan for the state.

The new Council and Executive Director will undoubtedly influence the way CeNCOOS moves forward and prioritizes the list of items above. A continuous obstacle to reaching these goals is the uncertainty in IOOS funding. An ongoing challenge has been maintaining engagement of members building a stable support staff in the face of shifting IOOS timetables and a lack of clarity from NOAA as to how it will manage IOOS. An additional challenge is the loss of core programs, the Center for Integrated Marine Technologies (due to funding), and components of CICORE.

In contrast to the centralized structure of the Southern California Coastal Ocean Observing System (SCCOOS), which coordinates most ocean observing activities in southern California through a central hub at Scripps Institution, programs in the CeNCOOS region are managed independently. While this allows for broader participation and a more democratic approach, it makes it difficult to assemble the significant and stable support staff needed for bringing an integrated ocean observing system to fruition in central and northern California.

#### **4) Leadership Personnel**

Three new members will be elected to the Council in January 2008, creating a 15-member Council. The new Executive Director will lead the Council and CeNCOOS. The new Director is guiding our priorities and development, with a main focus on the conceptual design, executive summary, business plan, fundraising, outreach and product development.

As noted above, CeNCOOS Council and staff will review the current governance structure and potentially develop new committees and/or advisory councils and change the Council member obligations.

No new hires are expected before May 2008. We are awaiting notification of two pending grants. The outcome of this notification will very much influence our priorities, direction, and personnel.

The PI will become Steve Ramp (previously Francisco Chavez), but the grant host will not change.

#### **5) Budget Analysis**

A number of changes were made to the original budget, including:

- The obvious, significant change is the hiring of an Executive Director. This hire will allocate more funds to salary and travel.
- The subaward to SFSU will discontinue in 2007 until we decide how to redirect the funds or hire a new oceanographer/website/data manager
- Paul Siri was a contractor receiving \$100/hr for CeNCOOS for a total of approximately \$50K
- The MBNMS SIMoN program will receive \$10K in 2007 for additional assistance with oceanObs.
- CeNCOOS will continue Tom Wadsworth's job as the data manager and outreach staff for oceanObs, through a subaward to UCSC through mid-2008
- CeNCOOS plans to reallocate money for improved product development
- CeNCOOS will provide funds to host Council meetings
- CeNCOOS will provide funds to print and distribute outreach materials

- CeNCOOS has supported a number of workshops, such as the Coastal States Organization Workshop in San Francisco.

The total funds remaining for CeNCOOS is approximately \$500K (through mid-2008). Any changes made to the actual budget expenditures outlined in the proposal will move through the appropriate NOAA formalities before any of these anticipated expenditures (listed above) take place.